

REMARKS

These remarks are in response to the First Office Action dated May 23, 2007 (Office Action). As this reply is timely filed, no fee is believed due. Claims 1, 12, and 27 have been amended, and new claims 32-34 have been added. No new matter has been added. Previously withdrawn claims 13-26 have been canceled without prejudice, the Applicants reserving the right to present the canceled claims in one or more subsequent applications. Accordingly, claims 1-12 and 27-34 are pending in the application.

Within these remarks more than one claim or more than one element from different claims may be addressed concurrently. This treatment of claims and/or elements of claims is solely to track the manner in which the rationale for rejecting the claims is set forth in the Office Action, e.g., where similar or the same citations are applied against more than one element from different claims. Though one or more elements of different claims may refer to similar or the same subject matter, the concurrent treatment of, or use of the same reasoning in support of, two or more claims and/or elements of different claims does not, in and of itself, imply that such claims and/or elements refer to the same subject matter or recite the same feature.

Objections to the Disclosure

In the Office Action, the disclosure, in particular paragraph 33, has been objected to for including embedded hyperlinks or other form of browser executable code. Paragraph 33 has been amended by removing each hyperlink. Accordingly, withdrawal of the objection to the specification is respectfully requested.

Rejections under 35 U.S.C. §112

Claims 1-12 and 27-31 have been rejected under 35 U.S.C. § 112, second paragraph over use of the phrase "unidirectional flow." Claims 1 and 27 have been amended to recite "unidirectional links" instead of "unidirectional flow." Support for this amendment can be found at least in paragraph 66 of the Applicants' specification. Accordingly, withdrawal of the 35 U.S.C. § 112, second paragraph rejection of claims 1-12 and 27-31 is respectfully requested.

Allowable Subject Matter

The Office Action indicates that claims 10-12 and 31 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112, second paragraph and to include all of the limitations of the base claims any intervening claims. The Applicants thank the Examiner for this recognition of patentable subject matter. New claim 32 corresponds to original claim 10 properly rewritten in independent form, including the above-mentioned amendment to original claim 1 to overcome the 35 U.S.C. § 112, second paragraph rejection. New claims 33 and 34 depend from claim 32. Therefore, the Applicants respectfully request allowance of claims 32-34. Claim 31, which depends from claim 27, includes the above-mentioned amendment to claim 27 to overcome the 35 U.S.C. § 112, second paragraph rejection. Furthermore, claim 31 is believed to be allowable in light of its dependence from claim 27, which is believed to be allowable for the reasons set forth below.

Rejections under 35 U.S.C. § 102(b) – U.S. Patent No. 6,377,992

Claims 1-4 and 28 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,377,992 to Plaza et al. (Plaza). Claims 1 and 28 relate to simulation of a design within a high level modeling system (HLMS). In response to determining that a link of a design to be simulated is bidirectional, the bidirectional link can be emulated using first and second unidirectional links within the HLMS.

Plaza does not relate to simulation of a design or to emulation of a bidirectional link of a design. Instead, Plaza relates to the integration of several physical media for communications between two computing systems. This integration occurs at layer 3 of the OSI model. Plaza teaches that an interface can be emulated through a virtual driver that masks interfaces of other drivers. For example, at column 11, line 50, Plaza states:

... the IVI interface which doesn't exist physically, but is emulated by machine operations effecting a software simulation of a real bi-directional interface in accordance with the IVI driver 60. In reality, the IVI driver 60 wires the data to ("switches the data to") Interface B driver, which in turn places the data into the real interface B.

This passage and the surrounding language of column 11 illustrate that a physically, non-existent IVI interface can be emulated through the IVI driver. The IVI driver effectively communicates with underlying interface drivers (e.g., A and B) so that systems need only interact with the IVI driver rather than each underlying driver (e.g., interface drivers A and B) to access physical interfaces A or B.

As such, Plaza does not take a bidirectional link and emulate the bidirectional link as a first unidirectional link and a second unidirectional link. Whereas the Applicants' invention, as recited in claims 1 and 28, generally breaks down a bidirectional link into first and second unidirectional links for emulation, Plaza functions in the opposite manner. Plaza effectively combines a plurality of interfaces into a single, larger interface by inserting into a system a virtual driver. The virtual driver provides unified access to the plurality of interfaces, e.g., the "combined" interfaces.

In sum, Plaza does not teach or suggest that a bidirectional link of a circuit design is emulated as two unidirectional links within an HLMS. The remaining claims rejected under Plaza are believed to be allowable in view of their own merits and further by virtue of their dependence from the underlying base claim(s) discussed above. Accordingly, withdrawal of the 35 U.S.C. § 102(b) rejection of claims 1-4 and 28 is respectfully requested.

Rejections under 35 U.S.C. § 102(e) – U.S. Patent Publication No. 2004/0250244

Claims 1-4 and 28 further have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2004/0250244 to Albrecht (Albrecht). Albrecht does not teach or suggest the features recited in claims 1-4 or 28. Albrecht teaches that a gateway can be disposed between a simulation system having two unidirectional "pipes" and a debugger having a bidirectional pipe. The gateway effectively serves as an interface between the two.

With regard to claims 1 and 28, Albrecht does not teach or suggest that a bidirectional link is emulated as two unidirectional links. Instead, Albrecht teaches that a system that has a bidirectional communication channel can be coupled with a system that has multiple unidirectional communication channels through a gateway.

Moreover, the bidirectional link that is emulated as two unidirectional links recited in claims 1 and 28 is specified by the design, e.g., the design that is simulated within the HLMS. The communication pipes described by Albrecht, and referenced by the Office Action, are neither simulated nor part of the design that is simulated. Rather, the pipes exist between, e.g., link, the simulator and the debugger.

In this regard, Albrecht does not teach or suggest the Applicants' invention as recited in the claims. The remaining claims rejected under Albrecht are believed to be allowable in view of their own merits and by virtue of their dependence from the underlying base claim(s) discussed above. Withdrawal of the 35 U.S.C. § 102(e) rejection of claims 1-4 and 28 is respectfully requested.

Rejections under 35 U.S.C. § 102(e) – U.S. Patent Publication No. 2003/0214965

Claims 1-4 also have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2003/0214965 to Chen et al. (Chen). Chen is not related to the Applicants' invention as recited in the claims. Chen teaches that the receiver portion of a transceiver can be removed and replaced with structure that generates a constant signal. The transceiver no longer receives signals. The portion of the transceiver that checks for reception of a signal and that is responsible for disabling the transceiver when no signal is received is fed with the constant signal. The bidirectional transceiver is effectively changed into a unidirectional transmitter with the auto shut-off mechanism ordinarily coupled to the receiver being disabled. This overcomes the condition wherein an error condition is assumed in a transceiver when no signal is received causing the transceiver to be disabled. Thus, Chen is directed to a hardware implementation, not to simulation of a design within an HLMS that supports unidirectional links.

Notwithstanding the lack of discussion of simulation within Chen, the Applicants' claims recite that the bidirectional link is emulated using a first unidirectional link and a second unidirectional link. Chen teaches that a bidirectional system is transformed into a single unidirectional system, e.g., a transmitter. The result obtained by Chen is that of a single unidirectional "link," not first and second unidirectional links. Moreover, claim 2 recites that the two unidirectional links have

opposite data-routing orientations. That feature is lacking from the passages of Chen cited in the Office Action.

The remaining claims rejected under Chen are believed to be allowable in view of their own merits and further by virtue of their dependence from the underlying base claim(s) discussed above. In view of the above, withdrawal of the 35 U.S.C. § 102(e) rejection of claims 1-4 is respectfully requested.

Rejections under 35 U.S.C. § 102(e) – U.S. Patent No. 6,961,691

Claims 1-9 and 27-30 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,961,691 to Selvidge et al. (Selvidge). Selvidge, like Chen, is unrelated to the Applicants' invention as recited in the claims. Selvidge discusses the manner in which a common clock signal can be distributed among two different emulation systems, e.g., different circuit board groups, which are to operate cooperatively. In the abstract, Selvidge states:

A method allows two substantially asynchronous system components of a logic emulation system to exchange data packets with reference to a clock signal of predetermined frequency. In one example, each bit is transmitted across the system components over two or more cycles of the clock signal. The reference clock signal can be distributed to the two system components from a common clock signal generator, or can be generated locally independently.

The Selvidge abstract describes a process for distributing a clock signal to asynchronous components of logic emulation. Selvidge does not teach or suggest that a bidirectional link can be emulated as first and second unidirectional links.

In rejecting claims 1-9 and 27-30, only figures from Selvidge have been cited. As noted above, the subject matter of Selvidge appears to be unrelated to claims 1-9 and 27-30. In view of the textual discussion within the Selvidge specification, it seems that the figures referenced in support of the 35 U.S.C. § 102(e) rejection have been applied in a manner that is inconsistent with the accompanying text. When the figures and supporting text are taken together, Selvidge fails to teach or suggest the features recited in claims 1-9 and 27-30.

The Applicants respectfully request that supporting language from the Selvidge specification be cited in combination with the figures in a new non-final action so that Applicants may form a more specific response.

For example, with reference to claims 1 and 27, it is asserted that Selvidge teaches “in response to determining the link to be bidirectional, emulating the link in the design using first and second unidirectional links within the high level modeling system.” In support, the Office Action cites blocks 701 and 702 and signal 730 of FIG. 7 along with the emulation system 100 of FIG. 1. Block 701 is an emulation system and block 702 is a controller. Accordingly, the links connecting the two blocks, like Plaza, are neither simulated nor part of the design that is simulated. The links are part of the simulation system itself.

Further, blocks 701 and 702 are linked by signal 730, which is a unidirectional signal, not a bidirectional signal as asserted in the Office Action. Though a feedback path is taken from signal 730, this feedback path exists within block 701. Consequently, signal 730 is a unidirectional signal linking blocks 701 and 702. The signal linking control 714 and 724 is a bidirectional signal. In any case, this schematic of an emulation system 701 and a controller 702 fails to teach or suggest that a bidirectional link in a design to be simulated is emulated as first and second unidirectional links. In fact, blocks 701 and 702 appear to be linked only by a single bidirectional link and a single unidirectional link, with both links being independent of on another.

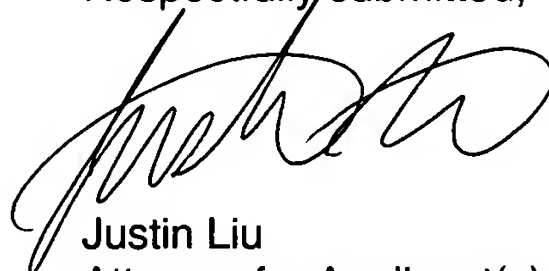
The remaining claims rejected under Selvidge are believed to be allowable in view of their own merits and further by virtue of their dependence from the underlying base claim(s) discussed above. Accordingly, withdrawal of the 35 U.S.C. § 102(e) rejection of claims 1-9 and 27-30 is respectfully requested.

CONCLUSION

All claims should be now be in condition for allowance and a Notice of Allowance is respectfully requested.

If there are any questions, the Applicants' attorney can be reached at Tel: 408-879-4641 .

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on August 16, 2007.

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